

Employment Opportunity with NAIF
November 2016

JPL's Navigation and Ancillary Information Facility (NAIF) seeks to hire a new, permanent staff member.

We are looking for someone who can fill multiple, quite different roles within NAIF.

- **SPICE Core Development:** conceive, design, implement, document and test "small," single purpose SPICE APIs as well as "large" subsystem API families.
- **SPICE 2.0 Development:** help design, implement, document and test a “from the ground up” re-implementation of the SPICE Toolkit using C++, with particular focus on thread safety and object-oriented attributes.
- **SPICE-based web services:** help maintain and implement new SPICE-based web services, such as the currently available WebGeocalc tool.
- **SPICE-based visualization:** help maintain and implement new SPICE-based observation geometry visualization tools, such as the currently available SPICE-Enhanced Cosmographia tool.
- **Mission operations:** operate and problem solve SPICE kernel production for NASA flight projects (ongoing and new) that hire NAIF to fill the SPICE operations role.
- **SPICE archive production:** produce and validate high quality SPICE archives for delivery to the Planetary Data System, using both the PDS3 and PDS4 archive standards, for ongoing and new missions.
- **User support:** having obtained a broad understanding of the full SPICE domain, provide consultation and problem solving for SPICE users, and participate in the development of training materials and the teaching of SPICE classes.

Persons with an aerospace, mechanical, or electrical engineering degree, or having an applied math background, are most likely to best meet our needs. Whatever the background, having a proven, strong engineering programming aptitude is required.

NAIF is far more than a software shop. Nevertheless, the production of very high quality code is an important part of our work. We currently write distributable code in Fortran 77, C, IDL, Matlab and Java, and are now starting to expand into C++. We also use Perl and shell scripting in internal processes, and are expanding into some use of Google Web Toolkit and a variety of other packages, including codes used in graphics and web services. A candidate need not be an expert in all of these, but must have the aptitude and willingness to learn what is needed. Bringing yet other programming and information technology skills to the NAIF/SPICE endeavor would be a plus.

In NAIF we have a rule-of-thumb that one must spend equal amounts of time on writing a piece of code, writing and exercising test code, and documenting the code. We understand

that carefully and fully testing and documenting code may not be totally blissful, but these are firm requirements.

NAIF has developed standards for coding style (including extensive internal documentation), code testing methodology, and the writing of a variety of documents describing file formats and content, code design and code use. All team members are required to use these standards since they lead to a more consistent product—thus easier for our users to understand and easier for us to maintain.

Since a great deal of our "product" is textual, excellent aptitude with written technical English is a firm requirement.

NAIF suggests anyone contemplating joining the team take a close look at examples of the tangible NAIF products: the NAIF website, <http://naif.jpl.nasa.gov/naif/index.html>; samples of source code with included documentation, plus the variety of documents found in each Toolkit such as found here <http://naif.jpl.nasa.gov/naif/documentation.html>; and a typical mission archive such as this one for Mars Reconnaissance Orbiter http://naif.jpl.nasa.gov/pub/naif/pds/data/mro-m-spice-6-v1.0/mrosp_1000/. Ask yourself if preparing and consulting on these kinds of products would be amenable to you.

The NAIF—currently five members—must act as a tightly-knit team. Any applicant would need to work well in such a cooperative environment. NAIF staff members also have many external interactions with engineers and scientists throughout the U.S. and around the globe; one needs excellent interpersonal skills to successfully carry out the NAIF business in this broad spectrum.

Publishing and/or presenting the results of one's work is a common part of many space science endeavors. However, within NAIF there is very little of this. We mostly consider our software, its allied documentation, the SPICE tutorials and the occasional SPICE training classes to be our "published" works. (On occasion we present a SPICE status poster at a science conference, mostly as an informational mechanism.)

It usually takes substantial time to train a new NAIF team member... often as much as a year. (The learning process really goes on much longer than that.) NASA, the NAIF group, and the SPICE user community wish to receive good value from an investment in such training. Consequently, we are looking for someone with SPICE experience who can confidently decide that staying with NAIF for the long run is consistent with her/his career goals. (The current team members have been working on SPICE from 20 to 34 years.)

Even though SPICE components are not restricted under U.S. export regulations, we are looking for a U.S. citizen or permanent resident alien (holder of a "green card").

Anyone interested in being considered for a job with NAIF as described above could apply to the JPL "Opportunities, Experienced" website:

<https://experienced-jpl.icims.com/jobs/search?hashed=-435741529&mobile=false&width=1366&height=500&bga=true&needsRedirect=false&jan1offset=-480&jun1offset=-420>